REMARKS

Upon entry of the amendment, claims 1-20 are pending. Claims 1-11, 13-15 and 17-20 have been amended to more particularly point out Applicant's invention. Applicant notes with appreciation that claims 3, 7-10, 13, 14, and 17 have been found to define allowable subject matter but were objected to as being dependent upon rejected base claims. Accordingly, claims 3, 7, 8, 14 and 17 have been rewritten in independent form to include all of the limitations of the rejected base claim and any intervening claim with the exception that the means language in the claims has been eliminated. Claims 9 and 10 depend from claim 8. Accordingly, claims 3, 7-10, 13, 14 and 17 should be allowable. Claims 4, 14 and 18-20 have been indicated as allowable if rewritten to overcome the rejections under 35 U.S.C. §112. As indicated below, these claims have been amended to overcome the rejection under 35 U.S.C. §112. In addition, claims 4, 14 and 18 have been rewritten in independent form. Claims 19 and 20 have been amended to depend upon claim 18. Accordingly, claims 4, 14 and 18-20 should also be allowable. Claims 1, 5, 11 and 15 have been amended to more particularly point out the Applicant's invention. It is respectfully submitted that these claims define patentable subject matter over the references of record. The Examiner is respectfully requested to reconsider and withdraw the rejection based on the amendment and the remarks below.

CLAIM REJECTIONS - 35 U.S.C. §112

Claims 4, 14 and 18-20 have been rejected under 35 U.S.C. §112, second paragraph, for being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. This rejection is based on the lack of an antecedent basis in claims 4, 14 and 18 for the phrase "said bit error rate (BER)" and the lack of an antecedent basis in claims 19 and 20 for "said dithering step." Claims 4, 14 and 18 have been amended to correct

the antecedent basis for the bit error rate (BER). In addition, claims 19 and 20 have been amended to depend on claim 18 as suggested in paragraph two of the Detailed Action. Accordingly, it is respectfully submitted that this rejection has been overcome. The Examiner is respectfully requested to reconsider and withdraw this rejection.

CLAIM REJECTIONS - 35 U.S.C. §102

Claims 1, 2, 5, 6, 11, 12, 15 and 16 have been rejected under 35 U.S.C. 102(b) as being anticipated by *Fulton* U.S. Patent No. 5,604,768. In order for there to be anticipation, each of the elements of the claims must be found in a single reference. It is respectfully submitted that the claims as amended recite elements not disclosed or suggested in the *Fulton* patent. For example, the claims now recite that the distance between two points is measured and that the decision boundary is a function of that distance. It is respectfully submitted that the *Fulton* patent does not disclose or suggest such a method for adjusting the decision boundary. As clearly set forth in column 7, line 53 et seq. of the *Fulton* patent, decision boundaries therein are adjusted for each ***received bit of the signal***. Such a method requires the distance to be measured between each received point and the decision boundary and is thus computation intensive. In contradistinction, the system recited in the claims at issue recites comparing the distance between two received points and adjusting the decision boundary as a function of that distance - 50% less computation intensive. For these reasons, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 1, 2, 5, 6, 11, 12, 15 and 16.

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CONCLUSION

In view of the foregoing remarks, Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Respectfully submitted,

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ATTACHMENT FOR CLAIM AMENDMENTS
VERSION WITH MARKINGS TO SHOW CHANGES MADE
U.S. Serial No. 09/240,275; Filed: January 29, 1999

1. (Twice Amended) A demodulator comprising:

[means] a system for receiving modulated signals defining received signals;

a storage device for storing initial decision boundaries for use in demodulating said modulated signals;

[means] a system for determining the distance between said received signals [relative to said initial decision boundaries];

[means] a system for adjusting said initial boundaries as a function of said distance, defining adjusted decision boundaries; and

[means] a system for decoding said modulated signals relative to said adjusted decision boundaries.

2. (Amended) The demodulator as recited in claim 1, wherein said system for adjusting [means] includes [means] a system for mapping said adjusted boundaries to a decision map.

3. (Twice Amended) [The] A demodulator [as recited in claim 1, further including] comprising:

a system for receiving modulated signals defining received signals;

a storage device for storing initial decision boundaries for use in demodulating said modulated signals;

a system for determining the distance between said received signals relative to said initial decision boundaries;

a system for adjusting said initial boundaries as a function of said distance defining adjusted decision boundaries;

a system for decoding said modulated signals relative to said adjusted decision boundaries; and

a system for transmitting and decoding a predetermined training sequence defining decoded reference signals and a symbol error counter for comparing said decoded reference signals to a predetermined training sequence to further improve the bit error rate.

4. (Amended) [The] A demodulator [as recited in claim 1] comprising:

a system for receiving modulated signals defining received signals;

a storage device for storing initial decision boundaries for use in demodulating said modulated signals;

a system for determining the distance between said received signals relative to said initial decision boundaries;

a system for adjusting said initial boundaries as a function of said distance, defining adjusted decision boundaries;

a system for decoding said modulated signals relative to said adjusted decision boundaries; and

a system for measuring the bit error rate (BER), wherein said system for adjusting [means] includes [means] a system for dithering the location of said decision boundaries while said bit error rate (BER) is measured and selecting the location of the decision boundary [which] where the BER is minimal.

5. (Twice Amended) A demodulator comprising:

[means] a system for receiving modulated signals defining received signals;

a storage device for storing a reference constellation;

[means] a system for determining the distance between said received signals [and said reference constellation];

[means] a system for adjusting the location of said reference constellation as a function of said distance defining an adjusted reference constellation and storing said adjusted reference constellation; and

[means] a system for decoding said received signals relative to said adjusted reference constellation.

6. (Amended) The demodulator as recited in claim 5, wherein said system for adjusting [means] includes [means] a system for mapping said adjusted reference constellation to a memory map.

7. (Amended) [The] A demodulator [as recited in claim 5, further including] comprising:

a system for receiving modulated signals defining received signals;

a storage device for storing a reference constellation;

a system for determining the distance between said received signals and said reference constellation;

a system for adjusting the location of said reference constellation as a function of said distance defining an adjusted reference constellation and storing said adjusted reference constellation;

a system for decoding said received signals relative to said adjusted reference constellation; and

a symbol error counter for comparing said decoded signals to a predetermined training sequence to further improve the bit error rate.

8. (Amended) [The] A demodulator [as recited in claim 5] comprising:

a system for receiving modulated signals defining received signals;

a storage device for storing a reference constellation;

a system for determining the distance between said received signals and said reference constellation;

a system for adjusting the location of said reference constellation as a function of said distance defining an adjusted reference constellation and storing said adjusted reference constellation; and

a system for decoding said received signals relative to said adjusted constellation,

wherein said system for adjusting [means] includes [means] a system for dithering each point in said reference constellation [while said bit error rate] and selecting a location for said reference constellation in which the bit error rate is minimal.

9. (Amended) The demodulator as recited in claim 8, wherein said system for dithering [means] includes [means] a system for dithering said points of said reference constellation in one or the other of a horizontal or vertical direction.

10. (Amended) The demodulator as recited in claim 8, wherein said system for dithering [means] includes [means] a system for dithering said points in said reference constellation in both [said] a horizontal and [said] a vertical direction.

11. (Twice Amended) A method for demodulating a signal comprising the steps of:

(a) receiving modulated signals defining received signals;

(b) storing a predetermined decision boundary for demodulating said received signals;

(c) determining the distance [of] between pairs of said received signals [relative to] and comparing said predetermined decision boundaries with the midpoint of said distance;

(d) adjusting said predetermined boundaries so as [a function] to be at the midpoint of said distance defining adjusted decision boundaries;

(e) storing said adjusted decision boundaries; and

(f) decoding said received signals relative to said adjusted decision boundaries.

13. (Twice Amended) A method for demodulating a signal [as recited in claim 11, further including] comprising the steps of: [transmitting and decoding a predetermined training sequence defining decoded reference signals and]

(a) receiving modulated signals defining received signals;

(b) storing a predetermined decision boundary for demodulating said received signals;

(c) determining the distance of said received signals relative to said predetermined decision boundaries;

(d) adjusting said predetermined boundaries as a function of said distance defining adjusted decision boundaries;

(e) storing said adjusted decision boundaries;

(f) decoding said received signals relative to said adjusted decision boundaries defining decoded signals; and

(g) providing a symbol error counter for comparing said decoded [reference] signals to [said] a predetermined training sequence to further improve the bit error rate.

14. (Amended) A method for demodulating a signal [as recited in claim 11,] comprising the steps of:

(a) receiving modulated signals defining received signals;

(b) storing a predetermined decision boundary for demodulating said received signals;

(c) determining the distance of said received signals relative to said predetermined decision boundaries;

(d) adjusting said predetermined boundaries as a function of said distance defining adjusted decision boundaries;

(e) storing said adjusted decision boundaries;

(f) decoding said received signals relative to said adjusted decision boundaries; and

(g) measuring the bit error rate; wherein said adjusting step comprises; [the steps of] dithering the location of said decision boundaries while said bit error rate (BER) is measured and selecting the location of the decision boundary at which the BER is minimal.

15. (Twice Amended) A method for demodulating a signal comprising the steps of:

(a) receiving modulated signals defining received signals;

(b) storing a reference constellation;

(c) determining the distance between pairs of said received signals [and a reference constellation];

(d) adjusting the location of said reference constellation as a function of said distance defining an adjusted constellation;

(e) storing said adjusted reference constellation; and

(f) decoding said signals relative to said adjusted reference constellation.

17. (Amended) A method for demodulating a signal [as recited in claim 15, further including] comprising the steps of:

(a) receiving modulated signals defining received signals;

(b) storing a reference constellation;

(c) determining the distance between said received signals and a reference constellation;

(d) adjusting the location of said reference constellation as a function of said distance defining an adjusted reference constellation;

(e) storing said adjusted reference constellation;

(f) decoding said signals relative to said adjusted reference constellation; and

(g) providing a symbol error counter for comparing said decoded signals to a predetermined training sequence to further improve the bit error rate.

18. (Amended) A method for demodulating a signal [as recited in claim 15, wherein said adjusting step includes] comprising the steps of:

(a) receiving modulated signals defining received signals;

(b) storing a reference constellation;

(c) determining the distance between said received signals and said reference constellation;

(d) adjusting the location of said reference constellation as a function of said distance defining an adjusted reference constellation;

(e) storing said adjusted reference constellation;

(f) decoding said signals relative to said adjusted reference constellation;

(g) measuring the bit error rate (BER); and

(h) dithering each point in said reference constellation while said bit error rate (BER) is measured and selecting a location for said reference constellation in which the bit error rate is minimal.

19. (Amended) A method for demodulating a signal as recited in claim [15] 18, wherein said dithering step comprises dithering said points of said reference constellation in one or the other of a horizontal or vertical direction.

20. (Amended) A method for demodulating a signal as recited in claim [15] 18, wherein said dithering step comprises dithering said points in said reference constellation in both said horizontal and said vertical direction.